

Study Programme : MSc in Biology			
Degree level: Master degree			
Course Title: Bacteriophage Biology			
Professor: Petar Knezevic			
Required/Elective Course: Elective			
Number of ECTS: 7			
Prerequisites:			
Course Objective: The aim of this course is to familiarize students with the specific biology of bacterial viruses, i.e. phage, as well as aspects of their application.			
Course Outcome: Through theoretical and practical lectures students will master skills related to working with bacteriophages, and will also understand the importance of this group of viruses in nature and significance for man.			
Course Content:			
<i>Theoretical part</i> History of phage research. Morphology of bacteriophage. Phage infection with bacterial cell-adherence and penetration. Virulent phages-multiplication, maturation, and lysis of bacterial cells. Temperate phages and regulation of gene expression. Classification of bacteriophages. Bacteriophage genomics and evolution. Bacteriophage ecology. The role of phages in bacterial virulence, phage application in detection and typing of bacteria. Importance of phages in commercial microbiology and industrial fermentation processes. Bacteriophages as vectors, vehicle for target molecules and expression systems. Phages as index and indicator organisms in sanitary microbiology. Application of phages and their enzymes to control pathogenic microorganisms.			
<i>Practical part</i> Work and equipment in virological laboratory. Phage morphotypes determination based on transmission electronic micrographs. Determination of phage protein profiles. Determination of molecular weight and characteristics of phage genome (RFLP). Phage isolation, multiplication and purification. Induction of phage from bacterial cultures. Bacteriophage resistance to environmental factors and storage of phage.			
Reading List:			
1. Kutter, E., Sulakvelidze, A. (2005): Bacteriophages- Biology and Applications. CRC Press.			
2. Calendar, R (2006): The Bacteriophages, 2nd ed. Ed. Oxfors University Press, New York			
1. Waldor, M. K., Friedman, D. I., Adhya, S. L. (2005): Phages: Their Role In Bacterial Pathogenesis And Biotechnology, ASM Press			
Total hours:			
Lectures: 2	Practicals:	Other: 2	Student research work: 5
Methods of instruction: Lectures with using PowerPoint presentations; Practice- individual student work			
Assessment (maximum number of points 100)			
Requirements	points	Final exam	points
Active participation in lectures	5	Practical exam	20
Active participation in practicals	30	Oral exam	20
Test(s) or	15		
Pre-exam testing			
Seminars	10		
Remark:			